

I CLAIM

1. Apparatus for processing data, said apparatus comprising:

  - (i) a processor core operable to execute native instructions of a native instruction set; and
  - (ii) an instruction translator operable to interpret non-native instructions of a non-native instruction set into native instructions for execution by said processor core; wherein
  - (iii) said instruction translator is responsive to a return to non-native instruction of said non-native instruction set to return processing to a non-native instruction; and
  - (iv) said instruction translator is responsive to a return to native instruction of said non-native instruction set to return processing to a native instruction.
2. Apparatus as claimed in claim 1, wherein said instruction translator is a hardware based instruction translator.
3. Apparatus as claimed in claim 1, wherein said instruction translator is a software based interpreter.
4. Apparatus as claimed in claim 1, wherein said instruction translator is a combination of a hardware based instruction translator and a software based interpreter.
5. Apparatus as claimed in any one of the preceding claims 1, wherein said non-native instructions are Java Virtual Machine instructions.
6. Apparatus as claimed in any one of the preceding claims, wherein a non-native subroutine is called from native code via a non-native veneer subroutine, such that, upon completion of said non-native subroutine, a return to non-native instruction can be used to return processing to said non-native veneer subroutine with a return to native instruction within said non-native veneer subroutine serving to return processing to said native code.

Sub  
A1

7. Apparatus as claimed in claim 6, wherein said non-native subroutine is also called from non-native code.

*sub A2*

8. Apparatus as claimed in any one of claims 6 and 7, wherein said non-native veneer subroutine is dynamically created when said non-native subroutine is called from native code.

9. Apparatus as claimed in claim 8, wherein said non-native veneer subroutine is created stored within a stack memory area used by native code operation.

*sub A3*

10. Apparatus as claimed in any one of the preceding claims, wherein said instruction translator is responsive to a plurality of types of return to non-native instruction.

*sub A3*

11. Apparatus as claimed in claim 10, wherein said plurality of types of return to non-native instruction are operable to return with respective different types of return value.

*sub A3*

12. Apparatus as claimed in claim 11, wherein said plurality of different types of return value include one or more of:

- (i) a 32-bit integer return value;
- (ii) a 64-bit integer return value;
- (iii) an object reference return value;
- (iv) a single precision floating point return value;
- (v) a double precision floating point return value; and
- (vi) a void return value having no value.

*sub A4*

13. Apparatus as claimed in any one of the preceding claims, wherein said instruction translator is responsive to a plurality of types of return to native instruction.

*sub A4*

14. Apparatus as claimed in claim 13, wherein said plurality of types of return to native instruction are operable to return with respective different types of return value.

15. A method of processing data, said method comprising the steps of:

- (i) executing native instructions of a native instruction set using a processor core, and
- (ii) interpreting non-native instructions of a non-native instruction set into native instructions for execution by said processor core; wherein
- (iii) in response to a return to non-native instruction of said non-native instruction set, returning processing to a non-native instruction; and
- (iv) in response to a return to native instruction of said non-native instruction set, returning processing to a native instruction.

*SDR*

16. A computer program product carrying a computer program for controlling a data processing apparatus in accordance with the method of claim 15.

17. Apparatus for processing data substantially as hereinbefore described with reference to Figures 1 to 13 and 18 to 21 of the accompanying drawings.

18. A method of processing data substantially as hereinbefore described with reference to Figures 1 to 13 and 18 to 21 of the accompanying drawings.

19. A computer program product carrying a computer program for controlling a data processing apparatus substantially as hereinbefore described with reference to Figures 1 to 13 and 18 to 21 of the accompanying drawings.